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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,370	08/16/2001	Stephen M. Dawson	16409/93578-00	3595

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EXAMINER

HO, THOMAS Y

ART UNIT PAPER NUMBER

3677

DATE MAILED: 07/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/931,370

Applicant(s)

DAWSON ET AL.

Examiner

Thomas Y Ho

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2, 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 8 recites the limitation "plurality of magnets" in line 21 of page 17. There is insufficient antecedent basis for this limitation in the claim. The independent claim (claim 6), from which claim 8 depends, recites the limitation "at least one magnet" in line 11 of page 17. Because "at least one magnet" covers a range including having a single magnet, it negates the possibility of having a plurality of magnets as disclosed in the dependent claim. It is unclear whether there can be a single magnet, or if there must be a plurality of magnets.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-5, 7, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson (US 5730447) in view of Murphy (US 5522601).

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As to claim 1, Dawson discloses a seal for sealing a rotatable shaft (2) and a fixed housing (1), said device comprising:

- An annular stator (5) and an annular rotor (3).
- The stator (5) having a seal means (25) (Col.4, Ln.30-36) for forming a seal with said housing (1).
- The rotor (3) having a seal (9) with said shaft (2) (Col.3, Ln.55-65).
- The rotor (3) and stator (5) each having contact faces (16, 17) (Col.5, Ln.8-12).
- At least one magnet (14) urging said contact faces together to form a seal when said stator (5) and said rotor (3) contact faces (16, 17) are in contact (Col.4, Ln.5-15).

Dawson fails to disclose or suggest the following limitations:

- The device having a means to mechanically couple said rotor to said stator so that said rotor moves axially independently of said stator for a predetermined range and once said predetermined range is exceeded, said rotor axial movement is couple to said stator axial movement.

However, Murphy discloses a seal having a means (28, 30) to mechanically couple a rotor (24) to a stator (26). The mechanical coupling means consists of a lip and a flange that are separate for an extent of axial travel, and after a limit point is reached, they mechanically join the two parts together in terms of axial movement (Col.5, Ln.17-35) because such an assembly uses less parts and also extends the useful life of the seal (Col.5, Ln.65-67; Col.6, Ln.1-4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the seal disclosed by Dawson to have a mechanical coupling means as taught by Murphy because it would decrease manufacturing costs and extend the life of the assembly.

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As to claim 3, Dawson discloses a seal wherein:

- There is a magnetic means (14) to couple the rotor (3) and the stator (5).

Dawson fails to disclose or suggest the following limitations:

- The means to mechanically couple includes an interlocking flange and annular groove, said flange positioned on one of said rotor and said stator, said annular groove positioned on the other of said rotor or said stator.

However, Murphy discloses a seal having a means (28, 30) to mechanically couple a rotor (24) to a stator (26). The mechanical coupling means consists of a lip (26) having a lower annular surface (44) formed on the stator (26) (Col.4, Ln.5-17), and a flange (30) formed on the rotor (Col.4, Ln.44-50) that interlock to couple the stator (5) with the rotor (3) (Col.5, Ln.17-35) in an interlocking fit because such an assembly uses less parts and also extends the useful life of the seal (Col.5, Ln.65-67; Col.6, Ln.1-4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the seal disclosed by Dawson to have a mechanical coupling means as taught by Murphy because it would decrease manufacturing costs and extend the life of the assembly.

As to claim 4, Dawson fails to disclose or suggest the following limitations:

- The annular groove is positioned on said stator and said flange is positioned on said rotor.

However, Murphy discloses a seal having a means (28, 30) to mechanically couple a rotor (24) to a stator (26). The mechanical coupling means consists of a lip (26) having a lower annular surface (44) formed on the stator (26) (Col.4, Ln.5-17), and a flange (30) formed on the rotor (Col.4, Ln.44-50) that interlock to couple the stator (5) with the rotor (3) (Col.5, Ln.17-35)

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in an interlocking fit because such an assembly uses less parts and also extends the useful life of the seal (Col.5, Ln.65-67; Col.6, Ln.1-4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the seal disclosed by Dawson to have a mechanical coupling means as taught by Murphy because it would decrease manufacturing costs and extend the life of the assembly.

As to claim 5, Dawson fails to disclose or suggest the following limitations:

- The annular groove is positioned on said rotor and said flange is positioned on said stator.

However, Murphy discloses a seal having a means (28, 30) to mechanically couple a rotor (24) to a stator (26). The mechanical coupling means consists of a lip (26) having a lower annular surface (44) formed on the stator (26) (Col.4, Ln.5-17), and a flange (30) formed on the rotor (Col.4, Ln.44-50) that interlock to couple the stator (5) with the rotor (3) (Col.5, Ln.17-35) in an interlocking fit because such an assembly uses less parts and also extends the useful life of the seal (Col.5, Ln.65-67; Col.6, Ln.1-4). Furthermore, Murphy also discloses that it would be equivalent to include the flange on the rotor, and the lip on the stator (Col.3, Ln.1-5). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the seal disclosed by Dawson to have a mechanical coupling means as taught by Murphy because it would decrease manufacturing costs and extend the life of the assembly.

As to claim 7, Dawson a seal for sealing a rotatable shaft (2) and a fixed housing (1), said device comprising:

- A stator (5) and a rotor (3).
- A means to magnetically couple said stator (5) and said rotor (3).

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- The stator (5) and the rotor (3) each having a contact face (16, 17).
- At least one magnet (14) for urging said contact faces (16, 17) together to form a seal between said stator (5) and said rotor (3) when said contact faces (16, 17) are in contact (Col.4, Ln.5-15).

Dawson fails to disclose or suggest the following limitations:

- The device having a means to mechanically couple said stator and said rotor.
- The means to mechanically couple said stator and said rotor forming a labyrinth between said stator and said rotor.

However, Murphy discloses a labyrinth seal having a means (28, 30) to mechanically couple a rotor (24) to a stator (26). The mechanical coupling means consists of a lip (26) having a lower annular surface (44) formed on the stator (26) (Col.4, Ln.5-17), and a flange (30) formed on the rotor (Col.4, Ln.44-50) that interlock to couple the stator (5) with the rotor (3) (Col.5, Ln.17-35) in an interlocking fit because such an assembly uses less parts and also extends the useful life of the seal (Col.5, Ln.65-67; Col.6, Ln.1-4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the seal disclosed by Dawson to have a mechanical coupling means as taught by Murphy because it would decrease manufacturing costs and extend the life of the assembly.

As to claim 9, Dawson discloses a seal for sealing a rotatable shaft (2) and a fixed housing (1), said device comprising:

- An annular stator (5) and an annular rotor (3).
- The stator (5) having a seal means (25) (Col.4, Ln.30-36) for forming a seal with said housing (1).

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- The rotor (3) having a seal means (9) for forming a seal with said shaft (2) (Col.3, Ln.55-65).
- The rotor (3) and stator (5) each having contact faces (16, 17) (Col.5, Ln.8-12).
- At least one magnet (14) urging said contact faces together to form a seal when said stator (5) and said rotor (3) contact faces (16, 17) are in contact (Col.4, Ln.5-15).

Dawson fails to disclose or suggest the following limitations:

- The device having an annular groove positioned on one of said stator or rotor.
- A flange positioned on the other of said stator or said rotor.
- The annular groove and the flange co-operating to mechanically couple said rotor to said stator so that said rotor moves axially independently of said stator for a predetermined range and once said predetermined range is exceeded, said rotor axial movement is couple to said stator axial movement.

However, Murphy discloses a seal having a means (28, 30) to mechanically couple a rotor (24) to a stator (26). The mechanical coupling means consists of a lip/groove (26) having a lower annular surface (44) formed on the stator (26) (Col.4, Ln.5-17), and a flange (30) formed on the rotor (Col.4, Ln.44-50) that interlock to couple the stator (5) with the rotor (3) (Col.5, Ln.17-35) in an interlocking fit because such an assembly uses less parts and also extends the useful life of the seal (Col.5, Ln.65-67; Col.6, Ln.1-4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the seal disclosed by Dawson to have a mechanical coupling means as taught by Murphy because it would decrease manufacturing costs and extend the life of the assembly.

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As to claim 10, Dawson discloses a seal having:

- A plurality of magnets (14) (Col.4, Ln.6-12).

As to claim 11, Dawson fails to disclose or suggest the following limitations:

- The flange and the annular groove have substantially complementary cross-sectional profiles.

However, Murphy discloses a seal having a means (28, 30) to mechanically couple a rotor (24) to a stator (26). The mechanical coupling means consists of a lip/groove (26) having a lower annular surface (44) formed on the stator (26) (Col.4, Ln.5-17), and a flange (30) formed on the rotor (Col.4, Ln.44-50) that interlock to couple the stator (5) with the rotor (3) (Col.5, Ln.17-35) in an interlocking fit because such an assembly uses less parts and also extends the useful life of the seal (Col.5, Ln.65-67; Col.6, Ln.1-4). Furthermore, Murphy discloses that the flange and groove should have complementary cross-sectional profiles to achieve a proper interference fit between the stator and rotor (Col.2, Ln.50-67; Col.3, Ln.1-3). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the seal disclosed by Dawson to have a mechanical coupling means as taught by Murphy because it would decrease manufacturing costs and extend the life of the assembly.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson (US 5730447) in view of Orlowski (US 5174583).

As to claim 2, Dawson discloses a seal for sealing a rotatable shaft (2) and a fixed housing (1), said device comprising:

- An annular stator (5) and an annular rotor (3).
- The stator (5) having a seal means (25) for forming a seal with said housing (1).

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- The rotor (3) having a seal means (9) for forming a seal with the shaft (2).
- The rotor (3) and stator (5) each having contact faces (16, 17).
- At least one magnet (14) urging said contact faces (16, 17) together to form a seal when said stator (5) and said rotor (3) contact faces (16, 17) are in contact (Col.4, Ln.5-15).

Dawson fails to disclose or suggest the following limitations:

- The device having a means to mechanically couple the stator and the rotor to allow the rotor to axially slide along the shaft.

However, Orlowski discloses a seal having a mechanically coupled stator (12) and rotor (24), wherein the coupling includes a third ring (62) that allows the rotor (24) to axially slide along the shaft (Col.3, Ln.19-26) in such a way that axial movement of the shaft will not break the seal between the stator and rotor and allow contaminants to pass (Col.2, Ln.26-30; Col.3, Ln.40-45). Furthermore, Orlowski discloses that the shaft may shift when an assembly is seeking a magnetic center (Col.3, Ln.1-5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the seal disclosed by Dawson to have a mechanical coupling means, as taught by Orlowski, to allow for axial movement of the shaft relative to the rotor so the shaft can seek a magnetic center without breaking the seal.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson (US 5730447) in view of Young (US 3755870).

As to claim 6, Dawson discloses a seal for sealing a rotatable shaft (2) and a fixed housing (1), said device comprising:

- A mechanically coupled stator (5) and rotor (3).

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- The rotor (3) and stator (5) each having a contact face (16, 17).
- At least one magnet (14) urging said contact faces (16, 17) together to form a seal when said stator (5) and said rotor (3) contact faces (16, 17) are in contact (Col.4, Ln.5-15).

Dawson fails to disclose or suggest the following limitations:

- The rotor being constructed substantially of a semi-flexible heat-resistant material.

However, Young discloses a rotor (34) (Col.3, Ln.48-54) made of a material that is both heat-resistant and yieldable (denoting flexibility) (Col.2, Ln.55-69; Col.3, Ln.1-10) to eliminate the need for applying lubricant between the rotor (34) and stator (30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the rotor disclosed by Dawson out of a semi-flexible heat-resistant material, as taught by Young, to eliminate the need for applying lubricant between the stator and rotor.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson (US 5730447) in view of Young (US 3755870), and further in view of Pelstring (US 6029978).

As to claim 8, Dawson discloses a seal wherein:

- Each of the plurality of magnets (14) is positioned in a cavity (15) on the rotor (3).

Dawson fails to disclose or suggest the following limitations:

- Each of said cavities having an epoxy channel having a bottom which opens into said cavity.
- Each of said epoxy channels further having a top portion, where said top portion is of larger cross-sectional area than the bottom.
- The epoxy positioned in the epoxy channel to hold the magnets in the cavities.

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However, Pelstring discloses a seal having magnets (22) mounted in cavities (area between 21 and 23), with each of the cavities having an epoxy channel having a bottom which opens into the cavity, a top portion (left side) of larger cross-sectional area than the bottom (right side, close to 9), with the epoxy positioned in the epoxy channel to hold the magnets (22) in the cavities (Col.5, Ln.54-63; Col.6, Ln.1-5) to provide a seal able to send stray electrical charges to the shaft (Col.2, Ln.24-31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the seal disclosed by Dawson to have epoxy and epoxy channels, as taught by Pelstring, to allow for the seal to release stray electrical charges.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4890941 to Calafell discloses a stator and rotor assembly.

US 3947944 to Washington discloses a shaft seal.

US 6182972 to Orlowski discloses a seal.

JP 401316568 A to Mori discloses a magnet structure for shaft seals.

US 5161804 to Orlowski discloses a magnetic seal.

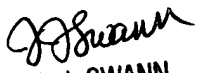
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Y. Ho whose email address is thomas.ho@uspto.gov and telephone number is (703) 305-4556. The examiner can normally be reached on M-F 9:30AM-6:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J.J. Swann can be reached on (703) 306-4115. The fax phone number for the organization where this application or proceeding is assigned is (703) 746-3366.

TYH

July 17, 2002


J. J. SWANN
SUPERVISORY PATENT EXAMINER
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